

BEFORE THE
PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

APPLICATION OF PALMETTO WASTEWATER RECLAMATION, INC. FOR AN
ADJUSTMENT OF ITS RATES AND CHARGES

DOCKET NO. 2021-153-S

EXHIBITS ACCOMPANYING THE

DIRECT TESTIMONY
OF
AARON L. ROTHSCILD

COST OF CAPITAL

ON BEHALF OF
SOUTH CAROLINA DEPARTMENT OF CONSUMER AFFAIRS

September 30, 2021

APPENDIX A: RESUME OF AARON L. ROTHSCHILD**SUMMARY**

Financial professional providing expert rate of return testimony in utility (water, electric and gas) rate case proceedings, applied mathematics research for utility industry as an affiliate of the New England Complex Systems Institute, and industry experience includes Head of Business Analysis for a major US telecom firm in Asia Pacific.

EXPERIENCE

Rothschild Financial Consulting, Ridgefield, CT**November 2001- present**

Independent consulting firm specializing in utility sector

President

- Provide financial testimony (e.g., rate of return and M&A) to state governments in utility rate cases, including the 2020 California energy cost of capital proceedings.
- Present at utility regulation conferences (NARUC/NASUCA and MARC) regarding rate of return, power purchase agreements, complex systems science, and subsidy auctions.

360 Networks, Hong Kong**January 2001 - October 2001**

Pioneer of the fiber optic telecommunications industry

Senior Manager

- Business development and investment evaluation
- Negotiated landing rights and formed local partnerships in Korea, Japan, Singapore, and Hong Kong for \$1 billion undersea cable project
- Structured fiber optic bandwidth swapping agreement with Enron and Global Crossing
- Established relationships with Hong Kong based Investment Bankers to communicate Asia Pacific objectives and accomplishments to Wall Street

Dantis, Chicago, IL**July 2000- December 2000**

Start-up managed data-hosting services provider

Director

- Built capital raise valuation models and negotiated with potential investors
- Team raised \$100M from venture capital firm through valuation negotiations and internal strategic analysis

MFS, MCI-WorldCom, Chicago, Hong Kong, Tokyo**September 1996- July 2000**

American Telecommunications Company

Head of Business Analysis for Japan operations

- Managed staff of 5 business development analysts
- Raised \$80M internally for Japanese national fiber network expansion plan by conducting an investment evaluation and presenting findings to CEO of international operations in London, UK
- Built financial model for local fiber optic investment evaluation that was used by business development offices in Oak Brook, IL and Sydney, Australia

EDUCATION

Vanderbilt University, Nashville, TN

1994-1996

MBA, Finance

- Completed business plan for Nextlink Communications in support of their national fiber optic network expansion, including identifying opportunities from passage of Telecom Act of 1996
- Developed analytical framework to evaluate predictability of rare events
- Provided financial and accounting analysis to Chicago's consumer advocate, the Citizens Utility Board (CUB) as a summer intern

Clark University, Worcester, MA

1990 - 1994

BA, Mathematics

APPENDIX B: TESTIFYING EXPERIENCE OF AARON L. ROTHSCHILD**1 Filed Rate of Return Testimonies:****California**

- Pacific Gas and Electric Company, Application 21-01-004, Securitization, February 2021
- Pacific Gas and Electric Company, Application 20-04-023, Securitization, October 2020
- Southern California Edison, Application 20-07-008, Securitization, September 2020
- San Diego Gas & Electric Company, Application 19-04-017, Rate of Return, August 2019
- Southern California Gas Company, Application 19-04-016, Rate of Return, August 2019
- Pacific Gas and Electric Company, Application 19-04-015, Rate of Return, August 2019
- Southern California Edison, Application 19-04-014, Rate of Return, August 2019
- Liberty Utilities, Application A.18-05-006, Rate of Return, August 2018
- San Gabriel Water Company, Application 18-05-005, Rate of Return, August 2018
- Suburban Water Company, Application 18-05-004, Rate of Return, August 2018
- Great Oaks Water Company, Application 18-05-001, Rate of Return, August 2018
- California Water Service Company, Application 17-04-006, Rate of Return, August 2017
- California American Water Company, Application 17-04-003, Rate of Return, August 2017
- Golden State Water Company, Application 17-04-002, Rate of Return, August 2017
- San Jose Water Company, Application 17-04-001, Rate of Return, August 2017

Colorado

- Public Service Company of Colorado, Docket No. 11AL-947E, Rate of Return, March 2012

Connecticut

- Eversource and United Illuminating, Docket No. 17-12-03RE11, Rate of Return / Interim Rate Reduction, April 2021
- United Water Connecticut, Docket No. 07-05-44, Rate of Return, November 2008
- Valley Water Systems, Docket No. 06-10-07, Rate of Return, May 2007

Delaware

- Tidewater Utilities, Inc., PSC Docket No. 11-397, Rate of Return, April 2012

Florida

- Florida Power & Light (FPL), Docket No. 070001-EI, October 2007
- Florida Power Corp., Docket No. 060001 Fuel Clause, September 2007

New Jersey

- Aqua New Jersey, Inc., BPU Docket No. WR11120859, Rate of Return, April 2012

Maryland

- Delmarva Power & Light, Case No. 9317, Rate of Return, June 2013
- Columbia Gas of Maryland, Case No. 9316, Rate of Return, May 2013
- Potomac Electric Power Company, Case No. 9286, Rate of Return, March 2012
- Delmarva Power & Light, Case No. 9285, Rate of Return, March 2012

North Dakota

- Montana-Dakota Utilities Co., Case No. PU-20-379, Rate of Return, January 2021
- Otter Tail Power Company, Case No. PU-17-398, Rate of Return, May 2018
- Montana-Dakota Utilities Co., Case No. PU-15-90, Rate of Return, August 2015
- Northern States Power, Case No. PU-400-04-578, Rate of Return, March 2005

Pennsylvania

- UGI Utilities, Inc. – Electric Division, Docket No. R-2021-3023618, Rate of Return, May 2021
- Pennsylvania American Water Company, Docket No. P-2021-3022426, Rate of Return, February 2021
- Audubon Water Company, Docket No. R-2020-3020919, Rate of Return, November 2020
- Pennsylvania American Water Company, Docket No. R-2020-3019369 and R-2020-3019371, Rate of Return, September 2020
- Twin Lakes Utilities, Inc., Docket No. R-2019-3010958, Rate of Return, October 2019
- City of Lancaster Sewer Fund, Docket No. R-2019-3010955, Rate of Return, October 2019
- Community Utilities of Pennsylvania Inc. Wastewater Division, Docket No. R-2019-3008948, Rate of Return, July 2019
- Community Utilities of Pennsylvania Inc. Water Division, Docket No. R-2019-3008947, Rate of Return, July 2019
- Newtown Artesian Water Company, Docket No. R-20019-3006904, Rate of Return, May 2019
- Hidden Valley Utility Services, L.P. – Wastewater Division, Docket No. R-2018-3001307, Rate of Return, September 2018
- Hidden Valley Utility Services, L.P. – Water Division, Docket No. R-2018-3001306, Rate of Return, September 2018
- The York Water Company, Docket No. R-2018-3000019, Rate of Return, August 2018
- SUEZ PA Pennsylvania, Inc., Docket No. R-2018-000834, Rate of Return, July 2018
- UGI Utilities, Inc. – Electric Division, Docket No. R-2017-2640058, Rate of Return, April 2018
- Wellsboro Electric Company, Docket No. R-2016-2531551, Rate of Return, December 2016
- Citizens' Electric Company of Lewisburg, PA, Docket No. R-2016-2531550, Rate of Return, December 2016
- Columbia Gas of Pennsylvania, Inc., Docket No. R-2016-2529660, Rate of Return, June 2016
- Columbia Gas of Pennsylvania, Inc., Docket No. R-2015-2468056, Rate of Return, June 2015
- Pike County Light & Power Company, Docket No. R-2013-2397353 (gas), Rate of Return, April 2014
- Pike County Light & Power Company, Docket No. R-2013-2397237 (electric), Rate of Return, April 2014
- Columbia Water Company, Docket No. R-2013-2360798, Rate of Return, August 2013
- Peoples TWP LLC, Docket No. R-2013-2355886, Rate of Return, July 2013
- City of Dubois – Bureau of Water, Docket No. R-2013-2350509, Rate of Return, July 2013
- City of Lancaster – Sewer Fund, Docket No. R-2012-2310366, Rate of Return, December 2012
- Wellsboro Electric Company, Docket No. R-2010-2172665, Rate of Return, September 2010
- Citizens' Electric Company of Lewisburg, PA, Docket No. R-2010-2172662, Rate of Return, September 2010
- T.W. Phillips Gas and Oil Company, Docket No. R-2010-2167797, Rate of Return, August 2010
- York Water Company, Docket No. R-2010-2157140, Rate of Return, August 2010

- Joint Application of The Peoples Natural Gas Company, Dominion Resources, Inc. and Peoples Hope Gas Company LLC, Docket No. A-2008-2063737, Financial Analysis, December 2008
- York Water Company, Docket No. R-2008-2023067, Rate of Return, August 2008

South Carolina

- Dominion Energy South Carolina, Inc., Docket No. 2020-125-E, Rate of Return, November 2020
- Palmetto Utilities, Inc., Docket No. 2019-281-S, Rate of Return, May 2020
- Palmetto Utilities, Inc., Docket No. 2019-281-S, Accounting, May 2020
- Blue Granite Water Company, Docket No. 2019-290-WS, Rate of Return, January 2020

Vermont

- Central Vermont Public Service Corp., Docket No. 7321, Rate of Return, September 2007

Exhibit ALR-1

OVERALL COST OF CAPITAL
Palmetto Wastewater Reclamation, Inc.

	<u>Ratios</u>		<u>Cost Rate</u>		<u>Weighted Cost Rate</u>
					[D]
Long-Term Debt	50.74%	[A]	3.20%	[B]	1.62%
Short-Term Debt	0.00%		0.00%		0.00%
Preferred Equity	0.00%		0.00%		0.00%
Common Equity	49.26%	[A]	7.31%	[C]	3.60%
	100.00%				5.22%
<u>RECOMMENDED RANGES</u>					
			<u>Low</u>		<u>High</u>
Proxy Group Cost of Equity Range			6.13%		7.70%
Proxy Group Cost of Equity				6.92%	
Based on RFC Capital Structure Recommendation					
Capital Structure Risk Adjustment		[E]		0.00%	
Adjusted Recommended Cost of Equity Range			6.13%		7.70%
Gradual Implementation Adjustment				0.39%	
Company Specific Cost of Equity Recommendation				7.31%	
Cost of Capital Range			4.64%		5.42%
Based on Mr. Moul's Capital Structure Recommendation					
Capital Structure Risk Adjustment		[E]		-0.43%	
Adjusted Recommended Cost of Equity Range			5.70%		7.28%
Company Specific Cost of Equity Recommendation				6.88%	
Cost of Capital Range			4.94%		5.88%
Comprehensive Cost of Capital Range					
Cost of Debt Range			3.20%		3.79%
Common Equity Ratio Range			49.26%		49.26%
Comprehensive Cost of Capital Range			4.64%		5.72%

Sources:

- [A] Recommendation based on Proxy Group capital structures without considering short-term debt
[B] Average yield on Baa-rated public utility bonds for 2019 (4.19%), 2020 (3.39%), and 2021YTD (2.03% for corporate bonds)
[C] Company Specific Cost of Equity Recommendation based on RFC Capital Structure Recommendation
[D] Ratios times Cost Rate
[E] Based on estimate of 0.04% change in Cost of Equity for each 1% difference in Common Equity Ratio compared to the Proxy Group (Exhibit ALR-1 vs. Exhibit ALR-5, page 4).

Exhibit ALR-2

COST OF EQUITY SUMMARY

RFC Water Proxy Group (7 Companies)

		<u>Low</u>	<u>High</u>
DCF			
Constant Growth	[A]	8.05%	8.15%
Non-Constant Growth	[B]	5.80%	6.03%
CAPM			
3-Mo. Weighted Average (Jun. to Aug. 2021)			
3-Month Treasury Bill Risk-Free Rate	[C]	6.04%	6.76%
30-Year Treasury Bond Risk-Free Rate	[C]	6.68%	7.25%
Spot (Aug. 31, 2021)			
3-Month Treasury Bill Risk-Free Rate	[D]	6.22%	6.22%
30-Year Treasury Bond Risk-Free Rate	[D]	6.81%	6.81%
Average (Excluding NCGDCF)		6.76%	7.04%
Outer Quartile Range (Excluding NCGDCF)		6.13%	7.70%
Proxy Group Cost of Equity		6.92%	

Sources:

[A] Exhibit ALR-3, page 1

[B] Exhibit ALR-3, page 2 and Exhibit ALR-3, page 3

[C] Exhibit ALR-4, page 1

[D] Exhibit ALR-4, page 5

CONSTANT GROWTH DISCOUNTED CASH FLOW (DCF) - INDICATED COST OF EQUITY
RFC Water Proxy Group (7 Companies)

		Based on Average Market Price For Year Ending 8/31/2021	Based On Market Price As Of 8/31/2021
1 Dividend Yield On Market Price	[A]	1.73%	1.52%
2 Retention Rate:			
a) Market-to-Book Ratio	[A]	3.57	4.04
b) Dividend Yield on Book	[B]	6.17%	6.15%
c) Expected Return on Equity	[C]	10.80%	10.80%
d) Retention Rate	[D]	42.86%	43.08%
3 Reinvestment Growth	[E]	4.63%	4.65%
4 New Financing Growth	[F]	1.64%	1.93%
5 Total Estimate of Investor Anticipated Growth	[G]	6.27%	6.58%
6 Increment to Dividend Yield for Growth to Next Year	[H]	0.05%	0.05%
7 Indicated Cost of Equity	[I]	8.05%	8.15%

Sources:

[A] Exhibit ALR-5, page 1

[B] Line 1 x Line 2a

[C] Some of the considerations for determining Future Expected Return on Equity:

	<u>Median</u>	<u>Mean</u>	<u>From</u>
Value Line Expectation	11.50%	11.29%	Exhibit ALR-5, page 2
Return on Equity to Achieve <u>Zacks</u> Growth	8.23%	8.23%	Exhibit ALR-5, page 3
Average Historical Growth	10.60%	9.92%	
Earned Return on Equity in 2020	11.36%	10.39%	Exhibit ALR-5, page 2
Earned Return on Equity in 2019	10.35%	9.49%	Exhibit ALR-5, page 2
Earned Return on Equity in 2018	10.07%	9.89%	Exhibit ALR-5, page 2

[D] 1 - Line 2b / Line 2c

[E] Line 2c x Line 2d

[F] $S \times V = (\text{Ext. Fin. Rate}) \times (\text{Line 2a} - 1)$

S = rate of continuous new stock financing

V = fraction of funds raised by sale of stock that increases the book value of existing shareholders' common equity

[G] Line 3 + Line 4

[H] Line 1 x one-half of Line 5

[I] Line 1 + Line 5 + Line 6

Ext. Fin. Rate = 0.64%

From
Exhibit ALR-3, page 4

NON-CONSTANT GROWTH DISCOUNTED CASH FLOW (DCF) - INDICATED COST OF EQUITY
(BASED ON VALUE LINE FORECASTS AND CLOSING STOCK PRICE)
RFC Water Proxy Group

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
		Forecasted Dividends per Share					Growth	Book Value		Closing Stock Price		Cash Flow From Buying and Selling Stock (At Closing Price)					
		2021	2022	2023	2024	2025	2022-25	8/31/21	8/31/25	8/31/2021	8/31/2025	2021	2022	2023	2024	2025	IRR / DCF
		[A]	[A]	[B]	[B]	[A]	[B]	[C]	[C]	[D]	[E]	[F]	[F]	[F]	[F]	[F]	[G]
American States Water Corr	AWR	\$1.40	\$1.52	\$1.67	\$1.83	\$2.00	9.58%	\$17.43	\$23.17	\$92.21	\$122.59	(\$91.51)	\$1.52	\$1.67	\$1.83	\$123.59	9.08%
American Water Works Corr	AWK	\$2.36	\$2.57	\$2.74	\$2.91	\$3.10	6.45%	\$37.17	\$48.97	\$182.25	\$240.12	(\$181.07)	\$2.57	\$2.74	\$2.91	\$241.67	8.54%
Essential Utilities, Inc.	WTRG	\$1.04	\$1.12	\$1.21	\$1.30	\$1.40	7.72%	\$20.30	\$23.46	\$49.63	\$57.35	(\$49.11)	\$1.12	\$1.21	\$1.30	\$58.05	6.05%
California Water Service Grc	CWT	\$0.92	\$0.98	\$1.03	\$1.09	\$1.15	5.48%	\$18.33	\$19.78	\$63.55	\$68.57	(\$63.09)	\$0.98	\$1.03	\$1.09	\$69.15	3.53%
Middlesex Water Company	MSEX	\$1.10	\$1.15	\$1.21	\$1.28	\$1.35	5.49%	\$19.57	\$20.98	\$109.41	\$117.29	(\$108.86)	\$1.15	\$1.21	\$1.28	\$117.96	2.85%
The York Water Company	YORW	\$0.78	\$0.83	\$0.88	\$0.94	\$1.00	6.41%	\$11.36	\$12.69	\$51.57	\$57.60	(\$51.18)	\$0.83	\$0.88	\$0.94	\$58.10	4.48%
SJW Group	SJW	\$1.36	\$1.44	\$1.53	\$1.62	\$1.72	6.10%	\$34.05	\$39.74	\$69.33	\$80.92	(\$68.65)	\$1.44	\$1.53	\$1.62	\$81.78	6.08%
Maximum		\$2.36	\$2.57	\$2.74	\$2.91	\$3.10	9.58%	\$37.17	\$48.97	\$182.25	\$240.12	(\$49.11)	\$2.57	\$2.74	\$2.91	\$241.67	9.08%
Minimum		\$0.78	\$0.83	\$0.88	\$0.94	\$1.00	5.48%	\$11.36	\$12.69	\$49.63	\$57.35	(\$181.07)	\$0.83	\$0.88	\$0.94	\$58.05	2.85%
Median		\$1.10	\$1.15	\$1.21	\$1.30	\$1.40	6.41%	\$19.57	\$23.17	\$69.33	\$80.92	(\$68.65)	\$1.15	\$1.21	\$1.30	\$81.78	6.05%
Average		\$1.28	\$1.37	\$1.47	\$1.57	\$1.67	6.75%	\$22.60	\$26.97	\$88.28	\$106.35	(\$87.64)	\$1.37	\$1.47	\$1.57	\$107.18	5.80%

Sources:

- [A] Value Line: Most current data available at time of schedule preparation. 2025 data is VL forecast for 2024-26.
- [B] Straight line interpolation based on Value Line data, assuming constant dividend growth for 2022-25.
- [C] Straight line interpolation based on Value Line data, assuming constant book value growth for 2022-25.
- [D] EOD Data: Market Data as of August 31, 2021.
- [E] Stock Price projected assuming constant Market to Book Ratio (Exhibit ALR-5, page 1) and using VL projected Book Value.
- [F] Cash Flow from purchasing stock on September 1, 2021, receiving dividends through 2025, and selling on August 31, 2025.
 Negative number in 2021 reflects cash outflow required to purchase stock.
 Cash flow sources are 1) dividends and 2) proceeds of stock sale.
 2 of 4 dividends assumed received in 2021 and 2 of 4 in 2025 based on purchase and sale date.
- [G] Total return on equity to investor who purchased, held, and sold stock as described above,
 assuming Value Line projections of Dividends and Book Value are correct and
 assuming Stock Price grows at same rate as Book Value.
- DCF result is an Internal Rate of Return computation made using the "IRR" function built into Microsoft Excel
 based on projected cash flows from 2021 to 2025.

NON-CONSTANT GROWTH DISCOUNTED CASH FLOW (DCF) - INDICATED COST OF EQUITY
(BASED ON VALUE LINE FORECASTS AND LTM AVERAGE STOCK PRICE)
RFC Water Proxy Group

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
		Forecasted Dividends per Share					Growth	LTM Avg. Book Value		LTM Avg. Stock Price		Cash Flow From Buying and Selling Stock (At LTM Average Price)					
		2021	2022	2023	2024	2025	2022-25	2021	2025	8/31/21	8/31/25	2021	2022	2023	2024	2025	IRR / DCF
		[A]	[A]	[B]	[B]	[A]	[B]	[C]	[C]	[D]	[E]	[F]	[F]	[F]	[F]	[F]	[G]
American States Water Corr	AWR	\$1.40	\$1.52	\$1.67	\$1.83	\$2.00	9.58%	\$17.24	\$22.91	\$81.01	\$107.70	(\$80.31)	\$1.52	\$1.67	\$1.83	\$108.70	9.31%
American Water Works Corr	AWK	\$2.36	\$2.57	\$2.74	\$2.91	\$3.10	6.45%	\$36.09	\$47.54	\$158.13	\$208.33	(\$156.95)	\$2.57	\$2.74	\$2.91	\$209.88	8.76%
Essential Utilities, Inc.	WTRG	\$1.04	\$1.12	\$1.21	\$1.30	\$1.40	7.72%	\$19.45	\$22.47	\$44.85	\$51.82	(\$44.33)	\$1.12	\$1.21	\$1.30	\$52.52	6.31%
California Water Service Grc	CWT	\$0.92	\$0.98	\$1.03	\$1.09	\$1.15	5.48%	\$17.95	\$19.37	\$53.59	\$57.82	(\$53.13)	\$0.98	\$1.03	\$1.09	\$58.40	3.83%
Middlesex Water Company	MSEX	\$1.10	\$1.15	\$1.21	\$1.28	\$1.35	5.49%	\$19.48	\$20.89	\$86.30	\$92.51	(\$85.75)	\$1.15	\$1.21	\$1.28	\$93.18	3.15%
The York Water Company	YORW	\$0.78	\$0.83	\$0.88	\$0.94	\$1.00	6.41%	\$11.06	\$12.35	\$46.77	\$52.23	(\$46.38)	\$0.83	\$0.88	\$0.94	\$52.73	4.66%
SJW Group	SJW	\$1.36	\$1.44	\$1.53	\$1.62	\$1.72	6.10%	\$32.94	\$38.45	\$64.85	\$75.69	(\$64.17)	\$1.44	\$1.53	\$1.62	\$76.55	6.23%
Maximum		\$2.36	\$2.57	\$2.74	\$2.91	\$3.10	9.58%	\$36.09	\$47.54	\$158.13	\$208.33	(\$44.33)	\$2.57	\$2.74	\$2.91	\$209.88	9.31%
Minimum		\$0.78	\$0.83	\$0.88	\$0.94	\$1.00	5.48%	\$11.06	\$12.35	\$44.85	\$51.82	(\$156.95)	\$0.83	\$0.88	\$0.94	\$52.52	3.15%
Median		\$1.10	\$1.15	\$1.21	\$1.30	\$1.40	6.41%	\$19.45	\$22.47	\$64.85	\$75.69	(\$64.17)	\$1.15	\$1.21	\$1.30	\$76.55	6.23%
Average		\$1.28	\$1.37	\$1.47	\$1.57	\$1.67	6.75%	\$22.03	\$26.28	\$76.50	\$92.30	(\$75.86)	\$1.37	\$1.47	\$1.57	\$93.14	6.03%

Sources:

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 2 of 4 dividends assumed received in 2021 and 2 of 4 in 2025 based on purchase and sale date.
- [G] Total return on equity to investor who purchased, held, and sold stock as described above,
 assuming Value Line projections of Dividends and Book Value are correct and
 assuming Stock Price grows at same rate as Book Value.
- DCF result is an Internal Rate of Return computation made using the "IRR" function built into Microsoft Excel
 based on projected cash flows from 2021 to 2025.

COMMON SHARES OUTSTANDING AND EXTERNAL FINANCING RATE
RFC Water Proxy Group

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
		Common Stock Outstanding (Millions of Shares)								Annual Growth Rate		
		2016	2017	2018	2019	2020	2021	2022	2025	2016-20	2020-25	2016-25
		[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[B]	[B]	[B]
American States Water Company	AWR	36.6	36.7	36.8	36.9	36.9	37.3	37.5	37.5	0.22%	0.33%	0.28%
American Water Works Company,	AWK	178.1	178.4	180.7	180.8	181.3	181.5	182.0	190.0	0.45%	0.94%	0.72%
Essential Utilities, Inc.	WTRG	177.4	177.7	220.8	220.8	245.4	250.0	252.5	270.0	8.45%	1.93%	4.78%
California Water Service Group	CWT	48.0	48.0	48.1	48.5	50.3	51.0	52.0	53.0	1.21%	1.04%	1.11%
Middlesex Water Company	MSEX	16.3	16.4	16.4	17.4	17.5	17.8	17.9	18.0	1.75%	0.60%	1.11%
The York Water Company	YORW	12.9	12.9	12.9	13.0	13.1	13.0	12.9	12.8	0.41%	-0.40%	-0.04%
SJW Group	SJW	20.5	20.5	28.4	28.5	28.6	30.0	30.0	30.0	8.70%	0.99%	4.34%
Maximum		178.1	178.4	220.8	220.8	245.4	250.0	252.5	270.0	8.70%	1.93%	4.78%
Minimum		12.9	12.9	12.9	13.0	13.1	13.0	12.9	12.8	0.22%	-0.40%	-0.04%
Median		36.6	36.7	36.8	36.9	36.9	37.3	37.5	37.5	1.21%	0.94%	1.11%
Average		69.9	70.1	77.7	78.0	81.9	82.9	83.5	87.3	3.02%	0.78%	1.76%
Sustainable Growth [C]										0.64%		

Sources:

- [A] Value Line: Most current data available at time of schedule preparation.
[B] Annualized Growth Rate calculation.
[C] Estimated Sustainable Growth in Common Stock based on analysis of historical and projected growth rates.

CAPITAL ASSET PRICING MODEL (CAPM) - INDICATED COST OF EQUITY

WEIGHTED - All Inputs Weighted From June to August 2021

RFC Water Proxy Group

	3-Month Treasury Bill		30-Year Treasury Bond	
	Hybrid Beta	Forward Beta	Hybrid Beta	Forward Beta
Risk-Free Rate	0.05%	0.05%	1.95%	1.95%
Beta	0.74	0.66	0.74	0.66
Risk Premium	9.08%	9.08%	7.18%	7.18%
CAPM (Weighted)	6.76%	6.04%	7.25%	6.68%

CAPITAL ASSET PRICING MODEL (CAPM) - RISK-FREE RATE

Spot (Aug. 31, 2021)		
3-Month Treasury Bill		0.04%
30-Year Treasury Bond		1.92%
3-Mo. Weighted Average (Jun. to Aug. 2021)		
3-Month Treasury Bill		0.05%
30-Year Treasury Bond		1.95%

Source: www.treasury.gov

CAPITAL ASSET PRICING MODEL (CAPM) - BETAS
(BASED ON HISTORICAL AND OPTION-IMPLIED RETURNS)
RFC Water Proxy Group

Betas	06/01/2021	06/08/2021	06/15/2021	06/22/2021	06/29/2021	07/06/2021	07/13/2021	07/20/2021	07/27/2021	08/03/2021	08/10/2021	08/17/2021	08/24/2021	08/31/2021	Average	Time Avg.
Forward (6 months)	0.60	0.66	0.41	0.63	0.75	0.73	0.61	0.67	0.70	0.63	0.63	0.67	0.68	0.69	0.647	0.660
Historical (6 months)	1.00	1.03	1.02	1.03	1.00	0.99	1.01	0.97	0.95	0.93	0.90	0.76	0.65	0.58	0.914	0.842
Historical (2 yrs)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.83	0.820	0.822
Historical (5 yrs)	0.75	0.75	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.758	0.758
Weighting																
Forward (6 months)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%		
Historical (6 months)	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%		
Historical (2 yrs)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%		
Historical (5 yrs)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%		
Hybrid Beta (Forward & Historical)	0.75	0.78	0.66	0.77	0.82	0.81	0.76	0.78	0.78	0.75	0.74	0.72	0.70	0.69	0.751	0.739
Slope	15%															
Points	1.00	1.15	1.32	1.52	1.75	2.01	2.31	2.66	3.06	3.52	4.05	4.65	5.35	6.15		
Time Weight	2.5%	2.8%	3.3%	3.8%	4.3%	5.0%	5.7%	6.6%	7.6%	8.7%	10.0%	11.5%	13.2%	15.2%		

CAPM Betas	Spot (August 31, 2021)	Weighted (June - August 2021)
Forward	0.69	0.66
Hybrid	0.69	0.74

Note: Historical betas are calculated on Tuesdays, following Value Line's methodology. Forward (option-implied) betas are also calculated on Tuesdays for the sake of compatibility.

CAPITAL ASSET PRICING MODEL (CAPM) - MARKET RISK PREMIUM

WEIGHTED - All Inputs Weighted From June to August 2021

Cumulative Probability	50.00%	
S&P 500 Option-Implied Growth Rate	7.82%	
S&P 500 Dividend Yield	1.30%	
S&P 500 Market Return	9.12%	
	<u>3-Month Treasury Bill</u>	<u>30-Year Treasury Bond</u>
Risk-Free Rate	0.05%	1.95%
Option-Implied Market Risk Premium (Weighted)	9.08%	7.18%

CAPITAL ASSET PRICING MODEL (CAPM) - INDICATED COST OF EQUITY

SPOT - All Inputs Based on Last Available Data as of August 31, 2021

RFC Water Proxy Group

	3-Month Treasury Bill		30-Year Treasury Bond	
	Hybrid Beta	Forward Beta	Hybrid Beta	Forward Beta
Risk-Free Rate	0.04%	0.04%	1.92%	1.92%
Beta	0.69	0.69	0.69	0.69
Risk Premium	9.00%	9.00%	7.12%	7.12%
CAPM (Spot)	6.22%	6.22%	6.81%	6.81%

CAPITAL ASSET PRICING MODEL (CAPM) - MARKET RISK PREMIUM

SPOT - All Inputs Based on Last Available Data as of August 31, 2021

Cumulative Probability	50.00%	
S&P 500 Option-Implied Growth Rate	7.76%	
S&P 500 Dividend Yield	1.28%	
S&P 500 Market Return	9.04%	
	<u>3-Month Treasury Bill</u>	<u>30-Year Treasury Bond</u>
Risk-Free Rate	0.04%	1.92%
Option-Implied Market Risk Premium (Spot)	9.00%	7.12%

MARKET TO BOOK RATIO AND DIVIDEND YIELD
RFC Water Proxy Group

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
		Book Value per Share							Market Price			Mkt. to Book Ratio		Dividend Rate		Dividend Yield	
		Actual			Estimated												
		12/31/17	12/31/18	12/31/19	12/31/20	8/31/20	8/31/21	12/31/21	8/31/21	LTM High	LTM Low	8/31/21	LTM Avg.	MRQ	Annual	8/31/21	LTM Avg.
		[A]	[A]	[A]	[A]	[B]	[B]	[A]	[C]	[C]	[C]	[D]	[D]	[A]	[E]	[F]	[F]
American States Water Cor	AWR	\$14.45	\$15.19	\$16.33	\$17.39	\$17.04	\$17.43	\$17.45	\$92.21	\$92.77	\$69.25	5.29	4.70	\$0.335	\$1.340	1.45%	1.65%
American Water Works Cor	AWK	\$30.13	\$32.42	\$33.83	\$35.58	\$35.00	\$37.17	\$37.95	\$182.25	\$185.24	\$131.01	4.90	4.38	\$0.603	\$2.410	1.32%	1.52%
Essential Utilities, Inc.	WTRG	\$11.02	\$17.58	\$17.58	\$19.09	\$18.59	\$20.30	\$20.90	\$49.63	\$51.42	\$38.28	2.44	2.31	\$0.251	\$1.003	2.02%	2.24%
California Water Service Gr	CWT	\$14.44	\$15.19	\$16.07	\$18.30	\$17.56	\$18.33	\$18.35	\$63.55	\$65.99	\$41.19	3.47	2.99	\$0.230	\$0.920	1.45%	1.72%
Middlesex Water Company	MSEX	\$14.02	\$15.17	\$18.57	\$19.81	\$19.40	\$19.57	\$19.45	\$109.41	\$112.99	\$59.61	5.59	4.43	\$0.273	\$1.090	1.00%	1.26%
The York Water Company	YORW	\$9.28	\$9.75	\$10.31	\$10.97	\$10.75	\$11.36	\$11.55	\$51.57	\$52.97	\$40.57	4.54	4.23	\$0.187	\$0.750	1.45%	1.60%
SJW Group	SJW	\$22.57	\$31.31	\$31.27	\$32.12	\$31.84	\$34.05	\$35.00	\$69.33	\$71.69	\$58.01	2.04	1.97	\$0.340	\$1.360	1.96%	2.10%
Maximum		\$30.13	\$32.42	\$33.83	\$35.58	\$35.00	\$37.17	\$37.95	\$182.25	\$185.24	\$131.01	5.59	4.70	\$0.603	\$2.410	2.02%	2.24%
Minimum		\$9.28	\$9.75	\$10.31	\$10.97	\$10.75	\$11.36	\$11.55	\$49.63	\$51.42	\$38.28	2.04	1.97	\$0.187	\$0.750	1.00%	1.26%
Median		\$14.44	\$15.19	\$17.58	\$19.09	\$18.59	\$19.57	\$19.45	\$69.33	\$71.69	\$58.01	4.54	4.23	\$0.273	\$1.090	1.45%	1.65%
Average		\$16.56	\$19.52	\$20.57	\$21.89	\$21.46	\$22.60	\$22.95	\$88.28	\$90.44	\$62.56	4.04	3.57	\$0.317	\$1.267	1.52%	1.73%

Sources:

- [A] Value Line: Most current data available at time of schedule preparation.
[B] Straight-line interpolation of Actual and Estimated VL year-end values.
[C] EOD Data: Market Data as of August 31, 2021.
[D] Market Price divided by Book Value per Share.
[E] Most Recent Quarterly Dividend multiplied by 4.
[F] Dividend Rate divided by Market Price.

EARNINGS PER SHARE AND RETURN ON EQUITY
RFC Water Proxy Group

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
		Earnings per Share				Return on Equity			
		2017	2018	2019	2020	2018	2019	2020	VL Future Exp.
		[A]	[A]	[A]	[A]	[B]	[B]	[B]	[A]
American States Water Company	AWR	\$1.88	\$1.72	\$2.28	\$2.33	11.61%	14.47%	13.82%	13.00%
American Water Works Company, Inc.	AWK	\$2.38	\$3.15	\$3.43	\$3.91	10.07%	10.35%	11.27%	11.00%
Essential Utilities, Inc.	WTRG	\$1.35	\$1.04	\$1.04	\$1.12	7.27%	5.92%	6.11%	8.50%
California Water Service Group	CWT	\$1.40	\$1.36	\$1.31	\$1.97	9.18%	8.38%	11.46%	11.50%
Middlesex Water Company	MSEX	\$1.38	\$1.96	\$2.01	\$2.18	13.43%	11.91%	11.36%	13.00%
The York Water Company	YORW	\$1.01	\$1.04	\$1.11	\$1.27	10.93%	11.07%	11.94%	13.00%
SJW Group	SJW	\$2.86	\$1.82	\$1.35	\$2.14	6.76%	4.31%	6.75%	9.00%
Maximum		\$2.86	\$3.15	\$3.43	\$3.91	13.43%	14.47%	13.82%	13.00%
Minimum		\$1.01	\$1.04	\$1.04	\$1.12	6.76%	4.31%	6.11%	8.50%
Median		\$1.40	\$1.72	\$1.35	\$2.14	10.07%	10.35%	11.36%	11.50%
Average		\$1.75	\$1.73	\$1.79	\$2.13	9.89%	9.49%	10.39%	11.29%

Sources:

[A] Value Line: Most current data available at time of schedule preparation.

[B] Earnings per Share divided by average Book Value. Book Values shown on Exhibit ALR-5, page 1.

RETURN ON EQUITY IMPLIED BY ZACKS GROWTH RATES
RFC Water Proxy Group

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
		Book Value	EPS	Annual Dividend	Analyst 5 Year	Analyst-Implied Book Value before SV		Analyst-Implied Book Value Incl. SV		Implied EPS	Analyst-Implied
		12/31/20	2020	Rate	Growth Rate	12/31/2024	12/31/2025	12/31/2024	12/31/2025	2025	ROE
		[A]	[A]	[A]	[B]	[C]	[C]	[C]	[C]	[C]	[C]
American States Water Company	AWR	\$17.39	\$2.33	\$1.340	NA	NA	NA	NA	NA	NA	NA
American Water Works Company, Inc.	AWK	\$35.58	\$3.91	\$2.410	8.10%	\$42.90	\$45.11	\$53.43	\$59.36	\$5.77	10.23%
Essential Utilities, Inc.	WTRG	\$19.09	\$1.12	\$1.003	6.20%	\$19.64	\$19.79	\$23.64	\$24.96	\$1.51	6.23%
California Water Service Group	CWT	\$18.30	\$1.97	\$0.920	NA	NA	NA	NA	NA	NA	NA
Middlesex Water Company	MSEX	\$19.81	\$2.18	\$1.090	NA	NA	NA	NA	NA	NA	NA
The York Water Company	YORW	\$10.97	\$1.27	\$0.750	NA	NA	NA	NA	NA	NA	NA
SJW Group	SJW	\$32.12	\$2.14	\$1.360	NA	NA	NA	NA	NA	NA	NA
Maximum		\$35.58	\$3.91	\$2.410	8.10%	\$42.90	\$45.11	\$53.43	\$59.36	\$5.77	10.23%
Minimum		\$10.97	\$1.12	\$0.750	6.20%	\$19.64	\$19.79	\$23.64	\$24.96	\$1.51	6.23%
Median		\$19.09	\$2.14	\$1.090	7.15%	\$31.27	\$32.45	\$38.54	\$42.16	\$3.64	8.23%
Average		\$21.89	\$2.13	\$1.267	7.15%	\$31.27	\$32.45	\$38.54	\$42.16	\$3.64	8.23%

Sources:
[A] Value Line: Most current data available at time of schedule preparation.
[B] Zacks: Data as of September 14, 2021.
[C] Analyst-Implied Book Value and Return on Equity is obtained by escalating both Dividends and Earnings per Share by the stated Analyst Growth Rate and adding Earnings and subtracting Dividends for each projected year.
"SV" = S X V, where S = rate of continuous new stock financing and V = rate of return on common equity investment.

CAPITAL STRUCTURE WITH SHORT TERM DEBT
RFC Water Proxy Group

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
		% Common Equity					(\$ millions)					Percentage				
		2016	2017	2018	2019	2020	Total Debt	LT Debt	ST Debt	Pfd Stock	Equity	Total Capital	LT Debt	ST Debt	Pfd Stock	Equity Ratio
		[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[B]	[B]	[B]	[B]
American States Water Com	AWR	60.6%	62.0%	59.5%	55.6%	52.8%	\$ 569.7	\$ 569.3	\$ 0.4	\$ -	\$ 636.8	\$ 1,206.5	47.2%	0.0%	0.0%	52.8%
American Water Works Com	AWK	47.5%	45.3%	43.6%	41.4%	40.9%	\$ 10,751.0	\$ 9,325.0	\$ 1,426.0	\$ 3.0	\$ 6,455.4	\$ 17,209.4	54.2%	8.3%	0.0%	37.5%
Essential Utilities, Inc.	WTRG	51.6%	49.4%	56.9%	56.9%	46.0%	\$ 5,703.2	\$ 5,547.9	\$ 155.3	\$ -	\$ 4,726.0	\$ 10,429.2	53.2%	1.5%	0.0%	45.3%
California Water Service Gro	CWT	55.4%	57.3%	50.7%	49.8%	54.1%	\$ 1,221.1	\$ 781.0	\$ 440.1	\$ -	\$ 920.5	\$ 2,141.6	36.5%	20.5%	0.0%	43.0%
Middlesex Water Company	MSEX	61.5%	61.8%	61.6%	58.2%	55.7%	\$ 279.9	\$ 272.7	\$ 7.2	\$ 2.4	\$ 345.9	\$ 628.2	43.4%	1.1%	0.4%	55.1%
The York Water Company	YORW	57.4%	57.0%	57.5%	58.7%	53.7%	\$ 122.1	\$ 122.1	\$ -	\$ -	\$ 141.6	\$ 263.7	46.3%	0.0%	0.0%	53.7%
SJW Group	SJW	49.3%	51.8%	67.3%	40.9%	41.6%	\$ 1,379.3	\$ 1,303.0	\$ 76.3	\$ -	\$ 928.2	\$ 2,307.5	56.5%	3.3%	0.0%	40.2%
Maximum		61.5%	62.0%	67.3%	58.7%	55.7%	\$ 10,751.0	\$ 9,325.0	\$ 1,426.0	\$ 3.0	\$ 6,455.4	\$ 17,209.4	56.5%	20.5%	0.4%	55.1%
Minimum		47.5%	45.3%	43.6%	40.9%	40.9%	\$ 122.1	\$ 122.1	\$ -	\$ -	\$ 141.6	\$ 263.7	36.5%	0.0%	0.0%	37.5%
Median		55.4%	57.0%	57.5%	55.6%	52.8%	\$ 1,221.1	\$ 781.0	\$ 76.3	\$ -	\$ 920.5	\$ 2,141.6	47.2%	1.5%	0.0%	45.3%
Average		54.8%	54.9%	56.7%	51.6%	49.3%	\$ 2,860.9	\$ 2,560.1	\$ 300.8	\$ 0.8	\$ 2,022.1	\$ 4,883.7	48.2%	5.0%	0.1%	46.8%

Sources:

[A] Value Line: Most current data available at time of schedule preparation.

[B] Percentage calculated on Total Capital including Short Term Debt.

CAPITAL STRUCTURE WITHOUT SHORT TERM DEBT
RFC Water Proxy Group

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
		% Common Equity					(\$ millions)					Percentage				
		2016	2017	2018	2019	2020	Total Debt	LT Debt	ST Debt	Pfd Stock	Equity	Total Capital	LT Debt	ST Debt	Pfd Stock	Equity Ratio
		[A]	[A]	[A]	[A]	[A]	[A]	[A]	[B]	[A]	[A]	[A]	[B]	[B]	[B]	[B]
American States Water Comp	AWR	60.6%	62.0%	59.5%	55.6%	52.8%	\$ 569.7	\$ 569.3		\$ -	\$ 636.8	\$ 1,206.1	47.2%	0.0%	0.0%	52.8%
American Water Works Comp	AWK	47.5%	45.3%	43.6%	41.4%	40.9%	\$ 10,751.0	\$ 9,325.0		\$ 3.0	\$ 6,455.4	\$ 15,783.4	59.1%	0.0%	0.0%	40.9%
Essential Utilities, Inc.	WTRG	51.6%	49.4%	56.9%	56.9%	46.0%	\$ 5,703.2	\$ 5,547.9		\$ -	\$ 4,726.0	\$ 10,273.9	54.0%	0.0%	0.0%	46.0%
California Water Service Grou	CWT	55.4%	57.3%	50.7%	49.8%	54.1%	\$ 1,221.1	\$ 781.0		\$ -	\$ 920.5	\$ 1,701.5	45.9%	0.0%	0.0%	54.1%
Middlesex Water Company	MSEX	61.5%	61.8%	61.6%	58.2%	55.7%	\$ 279.9	\$ 272.7		\$ 2.4	\$ 345.9	\$ 621.0	43.9%	0.0%	0.4%	55.7%
The York Water Company	YORW	57.4%	57.0%	57.5%	58.7%	53.7%	\$ 122.1	\$ 122.1		\$ -	\$ 141.6	\$ 263.7	46.3%	0.0%	0.0%	53.7%
SJW Group	SJW	49.3%	51.8%	67.3%	40.9%	41.6%	\$ 1,379.3	\$ 1,303.0		\$ -	\$ 928.2	\$ 2,231.2	58.4%	0.0%	0.0%	41.6%
Maximum		61.5%	62.0%	67.3%	58.7%	55.7%	\$ 10,751.0	\$ 9,325.0		\$ 3.0	\$ 6,455.4	\$ 15,783.4	59.1%	0.0%	0.4%	55.7%
Minimum		47.5%	45.3%	43.6%	40.9%	40.9%	\$ 122.1	\$ 122.1		\$ -	\$ 141.6	\$ 263.7	43.9%	0.0%	0.0%	40.9%
Median		55.4%	57.0%	57.5%	55.6%	52.8%	\$ 1,221.1	\$ 781.0		\$ -	\$ 920.5	\$ 1,701.5	47.2%	0.0%	0.0%	52.8%
Average		54.8%	54.9%	56.7%	51.6%	49.3%	\$ 2,860.9	\$ 2,560.1		\$ 0.8	\$ 2,022.1	\$ 4,583.0	50.7%	0.0%	0.1%	49.3%

Sources:

[A] Value Line: Most current data available at time of schedule preparation.

[B] Percentage calculated on Total Capital excluding Short Term Debt.

Exhibit ALR-6

PWR's Cost of Debt

Interest rates for Baa rated corporate bonds

Year		Interest rate
2019	[A]	4.19%
2020	[A]	3.39%
2021 (Jan-Aug)	[B]	2.03%
Average		3.20%

Sources

[A] Mr. Moul's Direct Testimony, Schedule 11, page 1 of 3

[B] Federal Reserve Bank of St. Louis

Link: <https://fred.stlouisfed.org>

Economic Research Division

Moody's Seasoned Baa Corporate Bond Yield Relative
to Yield on 10-Year Treasury Constant Maturity, Percent, Monthly,
Not Seasonally Adjusted.

Frequency: Monthly

observation_date

BAA10Y

2021-01-01	2.16
2021-02-01	2.16
2021-03-01	2.13
2021-04-01	1.97
2021-05-01	2.00
2021-06-01	1.93
2021-07-01	1.93
2021-08-01	1.96